In view of these amendments, reconsideration and withdrawal of the rejection under 35 U.S.C. §112, second paragraph, are respectfully requested.

III. Rejections Under 35 U.S.C. §103(a)

Claims 1-7 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,458,711 (Yang) in view of U.S. Patent No. 4,483,438 (Kobiella) and U.S. Patent No. 4,265,954 (Romanek). The rejection is respectfully traversed.

Yang teaches a process for forming a grid of polymeric materials for supporting a structure including the steps of molding a polymeric material to form relatively thin strips, stretching the strips to the required extent to rearrange the polymer molecules to form long bonds resulting in strips with high tensile strength, and forming a grid by bonding together longitudinally and transversely disposed or otherwise angularly disposed stretched strips. Yang further teaches a grid of polymeric materials that utilize particular angles between adjoining carbon bonds.

As is correctly noted in the Office Action, Yang fails to teach or suggest in any manner the pattern of bonding or separated bonding lines/points within the zone of overlap as recited in claim 1 of the present invention.

Kobiella and Romanek do not remedy the deficiencies of Yang above, contrary to the assertions in the Office Action.

Kobiella teaches a joint with first and second overlapping portions of a loop of a wide thermoplastic strip, primarily intended to bind a stack of newspapers or magazines. By employing this wide strip, the tendency to damage the newspapers or magazines is reduced (see paragraph bridging columns 1 and 2).

When the first and second overlapping portions of the loop of Kobiella are welded together, the length of the portion of overlap, and hence the area of the weld, may be selected at the will of the user.

In contrast thereto, the maximum area of the weld in the perpendicular grids of the present invention equals the width of the strip squared. Thus, the maximum area of the weld in the grid made of strips having a width of 10 mm equals 100 mm^2.

Therefore, the maximum area of a weld in a loop in Kobiella made of overlapping strips having a width of 10 mm is dependent on the selected portion of overlap. If this portion of overlap is selected to be, for example, 50 mm, the maximum area of the weld amounts to 500 mm^2, which is five times larger than the maximum area in the grid of the present invention.

Therefore, one of ordinary skill in the art would not be motivated to combine the teachings of Kobiella (the overlapping of strips to form a weld) with the teachings of Yang (the particular angles between adjoining carbon atoms).

Romanek teaches the bonding of nonwoven sheets or webs of fibers to another sheet of material by fusion. The sheets comprise relatively large areas, and bonding over the entire surface thus can lead to stiff composites, which may make these composites unsuitable for some applications. Similar to Kobiella, Romanek teaches a very high portion of overlap in the area of the weld which can be selected at will. Thus, Romanek fails to teach or suggest the small area of overlap in the grids of the present invention.

Kobiella and Romanek teach that a large area of overlap may be used to spread the weld over a large area so as to reduce local detrimental affects of the welding process. In grids however, which are the subject of the present invention, the area available for welding is very limited and thus one skilled in the art will use as much of this area as possible.

The prior art also fails to teach or suggest the solution of the present invention to solve problems resulting from the complicated interaction between longitudinal and transverse strips in grids. The present invention is directed to a grid comprising drawn polymeric strips in at least two different directions, with the strips being bonded together in the zone or zones of overlap.

When bonded, grids tend to break or rupture more quickly at the bonds than might be expected on the basis of the strength itself and the bonding technique used. Accordingly, the present invention addresses a problem in the prior art of early rupture of grids and provides a grid and method of manufacture to eliminate and/or reduce the problem of early rupture.

Typically the strips of grids cross each other at angles. An angle of 90° is usually selected. Since the grids are made of drawn polymeric strips, the molecular chains forming the polymeric strips are predominantly oriented in the longitudinal direction of the strips. As a consequence, the (tensile) strength in that direction is high, and as a result of the weaker intermolecular bondings between the oriented polymeric chains in directions transverse to the longitudinal direction of the strip, the (tensile) strength is considerably lower in the transverse direction.

In the precise zones of overlap, this direction depending tensile strength leads to problems when the strips are bonded together. Forces exerted in the longitudinal direction of one strip will automatically be transferred via the bonding in forces transverse to the longitudinal direction of the other strip. However, as mentioned above, this is the direction of low tensile strength, and consequently, these "transverse forces" will cause the strip which has to bear the "transverse forces" to split.

A split caused in one strip will initiate in turn, via the bonding, a crack in the strip that runs in the perpendicular direction of the split strip. In summary, a load in the longitudinal

direction of one strip, although not exceeding its tensile strength, nevertheless will indirectly cause early breaking of that strip due to the explained force transfer mechanism. This will eventually lead to rupture of the complete grid structure.

An increased area of bonding results in a greater transfer of force which increases the risk of early rupture. The present invention describes that separating the welds in the zone or the zones of overlap will lead to a splitting only between the welds (in the spacial zone or zones) and hence no (or almost no) transfer of load or strength to the strip that runs in the perpendicular direction to the splitting one.

Applicants respectfully submit that the present invention solves a problem in the prior art which is not contemplated in the teachings of Kobiella and Romanek. All of the cited references fail to teach or suggest a solution to the problem of early rupture in a grid. None of the cited references teach an explanation or means to counteract early rupture.

Therefore, one skilled in the art who is confronted with a rupture problem of a grid like that of Yang is not motivated to have combined Yang with either Kobiella or Romanek, as neither Kobiella nor Romanek pertain to grids or give any explanation to the underlying reasons for early rupture.

For at least the foregoing reasons, Applicants respectfully submit that Yang, Kobiella and Romanek fail to teach or suggest the present invention. Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) are respectfully requested.

Claim 6 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of Kobiella and Romanek and further in view of U.S. Patent No. 3,560,291 (Foglia). This rejection is respectfully traversed.

The Patent Office alleges that Foglia teaches the use of a laser to bond thermoplastic structures. Foglia fails to remedy any of the deficiencies of Yang, Kobiella and Romanek. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Claim 8 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Yang in view of Kobiella and Romanek and further in view of U.S. Patent No. 3,674,583 (Allport). Claim 8 was further rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over WO 9747796 in view of Allport.

By this Amendment, claim 8 is canceled.

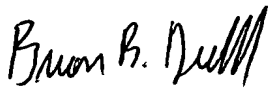
Accordingly, reconsideration and withdrawal of these rejections of claim 8 are respectfully requested.

IV. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 1-7 and 9-12 are in condition for allowance. Should the Examiner believe that anything further is necessary in order to place the application in even better condition for

allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



William P. Berridge
Registration No. 30,024

Brian B. Diekhoff
Registration No. 46,353

WPB:BBD/rxg

Attachment:
Appendix

Date: March 20, 2001

DEPOSIT ACCOUNT USE AUTHORIZATION
Please grant any extension necessary for entry;
Charge any fees due to our Deposit Account No. 15-0461

OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

APPENDIX

Changes to Claims:

Claim 8 is canceled.

The following are marked-up versions of the amended claims 3-5 and 7:

3. (Amended) A grid according to claim 1, wherein said at least one zone comprises at least one bonding point or line at or near each [of the] angular [points] point where the strips are bonded of the at least one zone.

4. (Amended) A grid according to claim 1, wherein [the] a width of the bonding points or lines is 5 mm or less.

5. (Amended) A grid according to claim 1, wherein [the] a width of the bonding points or lines is 3 mm or less.

7. (Amended) A grid according to claim 1, wherein the strength of a part of each bonding point or line at [the] an edge of the at least one zone of overlap is lower than the strength of a part of each bonding point or line at and near the center of the at least one zone or overlap.